

NUTRITION COUNSELLING, CARE AND SUPPORT FOR HIV-INFECTED WOMEN

**GUIDELINES ON HIV-RELATED
CARE, TREATMENT AND SUPPORT FOR
HIV-INFECTED WOMEN AND THEIR CHILDREN
IN RESOURCE-CONSTRAINED SETTINGS**



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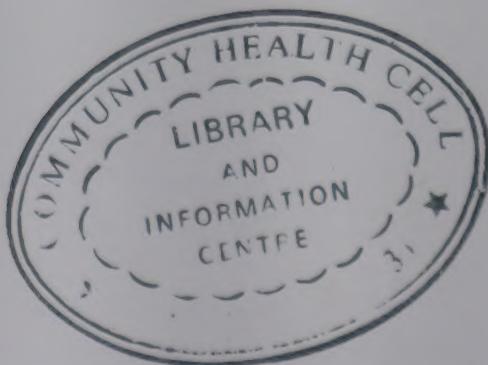
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DEPARTMENT OF HIV/AIDS AND DEPARTMENT OF
NUTRITION FOR HEALTH AND DEVELOPMENT

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ABBREVIATIONS

AIDS	acquired immunodeficiency syndrome
ARV	antiretroviral
BMI	body mass index
CDC	Centers for Disease Control and Prevention
FHI	Family Health International
HIV	human immunodeficiency virus
MTCT	mother-to-child transmission (of HIV)
OI	opportunistic infection
PI	protease inhibitor
RDA	recommended daily allowance
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

PREFACE

HIV/AIDS is the greatest health crisis the world faces today. An estimated 40 million people are now living with HIV/AIDS and, in 2003, the pandemic led to 5 million new infections and claimed 3 million lives. An increasing burden is being placed on women and children, who are experiencing growing rates of AIDS-related illness and death in many settings. Globally, about half of all adults living with HIV/AIDS are women, and 2.5 million children are living with the virus. A total of 700,000 children were newly infected in 2003, mainly through mother-to-child transmission of HIV. In the most severely affected countries, HIV/AIDS is wiping out families, destroying communities and threatening the social, economic and political gains of recent decades. This crisis has led to unprecedented political mobilization, new funding opportunities, and a renewed public health response seeking to scale up key prevention, care, treatment and support interventions, so that they may become available to all those who need them.

The relationship between nutrition and HIV/AIDS is complex and not fully documented to date. The HIV/AIDS epidemic poses a challenge to the health and overall socio-economic development in countries that have been greatly affected by the disease, which in turn may affect nutrition, and food security. Healthy nutrition plays a role in alleviating the symptoms - e.g. diarrhea, anorexia, sore mouth, muscle wasting - common with the HIV disease. There are however many gaps in current scientific knowledge on the impact that HIV/AIDS and malnutrition have on each other, the role of nutrition in the management of HIV/AIDS and interactions between nutrition and ARV treatment.

Successful approaches to tackling HIV/AIDS care are characterized by comprehensive strategies that address health needs as well as psychosocial care and support.

In this connection, HIV-infected women and children deserve particular attention as they represent a large proportion of the people requiring care and have specific nutrition, care and support needs. Nutritional care and support are essential elements of the comprehensive approach to HIV. However, adequate nutrition is vital for the health and survival for all individuals, regardless of their HIV status. Thus efforts to strengthen nutrition counseling, care and support for HIV-infected persons should be balanced with efforts to alleviate the overall burden of malnutrition, regardless of HIV status.

Action and investment to improve the nutrition of persons living with HIV should be based on sound scientific evidence, local resources, and programmatic and clinical experience with the prevention, treatment, and management of the disease. This document reviews the relationship between nutrition and HIV/AIDS and scientific evidence on the role of nutrition in HIV transmission, disease progression, morbidity, and disease management; and makes recommendations on nutrition counselling, care and support for HIV-infected women, based on current evidence. Many of the issues related to nutrition and HIV/AIDS are also considered in a comprehensive scientific review currently being undertaken by the WHO Technical Advisory Group on Nutrition and HIV/AIDS. The results of this review will be available in early 2005.

This document is part of a series of modules being developed by WHO and its partners on the care, treatment and support of HIV-infected women and their children in resource-constrained settings. It complements revised guidelines for antiretroviral treatment that have been issued in support of WHO's '3 by 5' initiative, which aims to support national efforts to provide antiretroviral treatment to three million people living with HIV/AIDS in resource-constrained settings by the end of 2005.

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1. BACKGROUND

1.1 INTRODUCTION

HIV infection affects nutritional status by causing increased energy requirements, reductions in dietary intake, nutrient malabsorption and loss, and complex metabolic alterations that culminate in the weight loss and wasting that are common in AIDS (1–3). The effect of HIV on nutritional status begins early in the course of infection, possibly even before the individual in question is aware of being infected (4–8).

1.2 MALNUTRITION AND HIV

Nutrition is an important component of comprehensive care for the HIV-infected woman and is particularly so in resource-limited settings where malnutrition and food insecurity are endemic. Pre-existing malnutrition, i.e. malnutrition occurring before HIV infection, compromises the immune system. The cellular effects of malnutrition on the immune system are similar to those of HIV. They include decreases in CD4 T-cells, suppression of delayed hypersensitivity, and abnormal B-cell responses (9–11).

The impact of nutrition on HIV and disease progression is difficult to study. A systematic review of the literature is being conducted by the WHO Technical Advisory Group on Nutrition and HIV/AIDS. Early studies demonstrated that reduced body cell mass and decreased serum albumin levels were associated with shorter survival in AIDS patients which was independent of the CD4 cell count (12, 13). Community-based research studies in the USA revealed that moderate weight loss (< 5%) and severe weight loss (5–10%) over a four-month period were associated with a subsequent increased risk of opportunistic infections, including *Pneumocystis jiroveci* (formerly *P. carinii*) pneumonia, cytomegalovirus and the *Mycobacterium avium* complex, and with mortality (14). Other studies showed that clinical outcome was comparatively poor and that the risk of death was comparatively high in HIV-infected patients with compromised micronutrient intake or status (15–21).

1.3 VITAMIN AND MINERAL DEFICIENCIES AND HIV

Deficiencies of vitamins and minerals, such as vitamins A, B-complex, C and E, and selenium and zinc, which are needed by the immune system to fight infection, are commonly observed in people living with HIV in all settings (4, 5, 7, 22, 23). Deficiencies of antioxidant vitamins and minerals contribute to oxidative stress, a condition that may accelerate immune cell death (24, 25) and increase the rate of HIV replication (26–28).

Short-term antioxidant supplementation has been shown to improve body weight and body cell mass (29), reduce HIV RNA levels and improve CD4 cell counts (30), and reduce the incidence of opportunistic infections (31) in small studies of adults with AIDS, including those on ARV treatment. In Thailand a larger placebo-controlled randomized trial on 481 ARV-naïve HIV-positive men and women revealed that daily micronutrient supplementation for one year reduced mortality in persons with baseline CD4 cell counts below $200 \times 10^6/l$, although supplementation had no effect on the CD4 cell count or on the plasma viral load. Further research is necessary in order to elucidate possible mechanisms for increased survival associated with micronutrient supplementation (32).

1.4 NUTRITION, PREGNANCY AND LACTATION, AND HIV

An HIV-infected woman's nutritional status before and during pregnancy influences both her health and survival and those of her newborn children. The physiological changes that occur during pregnancy require extra nutrients for adequate gestational weight gain in order to support the growth and development of the fetus (33). For women who are malnourished, daily energy-protein supplementation during pregnancy may improve maternal weight gain, increase infant birth weight and reduce the risks of stillbirth and perinatal mortality (34).

HIV infection increases energy requirements because of elevated resting energy expenditure (35–37). These additional needs, as well as the nutritional consequences of common HIV-related infections and illnesses, place HIV-infected pregnant and lactating women at greater nutritional risk than HIV-uninfected pregnant and lactating women. A meta-analysis of 31 studies conducted in developed and developing countries reported that intrauterine growth retardation, preterm delivery (< 37 weeks) and low birth weight (< 2500 g) were more common in infants born to HIV-positive mothers than in infants with HIV-negative mothers (38). The effects of HIV infection on pregnancy outcomes are likely to be more pronounced in women with symptomatic HIV infection, as has been observed in Tanzania (39).

Wasting during pregnancy is also more common in HIV-infected women than in the general population (40). A high plasma viral load, which is a marker of advanced disease, has been associated with lower lean and fat body mass in pregnancy (41). Several studies conducted in Africa indicate that an HIV-infected mother's nutritional status, measured by body mass index (BMI), mid-upper arm circumference and/or weight loss, is an important predictor of mortality during the postnatal period (42–44). Studies are planned in Malawi and Zambia to determine whether providing adequate nutrition to HIV-infected breastfeeding women can prevent the weight loss and nutritional depletion associated with both HIV infection and lactation.

1.5 MICRONUTRIENTS AND MOTHER-TO-CHILD TRANSMISSION OF HIV

Malnutrition during pregnancy results in low fetal stores of some nutrients. This impairs immune function and fetal growth and may increase the vulnerability of infants to HIV. Furthermore, poor nutrition during pregnancy may impair the integrity of the placenta, the genital mucosal barrier and the gastrointestinal tract. In each of these cases the transmission of HIV from mother to infant may be facilitated, although data confirming such relationships independently of maternal HIV disease progression are limited (45).

Low serum retinol, used as an indicator of vitamin A status, is associated with the shedding of HIV in genital tract secretions and in breast milk (46–48). Low serum retinol has also been associated with an increased risk of cervical disease in HIV-infected women (49). Serum retinol levels decline during infections, however, and consequently it is difficult to interpret correlations between them and HIV.

In randomized clinical trials, daily vitamin A supplementation with 10 000 IU of retinyl palmitate had no effect on vaginal HIV shedding among non-pregnant women in Mombasa (50) or on maternal antenatal and postnatal morbidity in Durban (51). However, a randomized trial among HIV-positive pregnant women in Dar es Salaam indicated that daily vitamin A supplementation increased viral shedding in the lower genital tract (52).

Early observational studies found that low serum retinol levels were associated with an increased risk of MTCT (53, 54). Randomized controlled clinical trials with vitamin A and beta-carotene, however, revealed no significant impact on HIV transmission during pregnancy and delivery (55–57). The following positive benefits of vitamin A supplementation on birth outcomes were observed.

- In Durban, daily supplementation with vitamin A (5000 IU) and beta-carotene (30 mg) during the third trimester of pregnancy, combined

with 200 000 IU vitamin A after delivery, reduced the risk of preterm delivery and was associated with improved maternal postpartum weight retention (55, 58).

- In Blantyre, Malawi, daily supplementation with vitamin A (10 000 IU), beginning at 18–28 weeks of gestation, was associated with increased birth weight, increased weight and length at six weeks and reduced rates of infant anaemia at six weeks (57).

Not all vitamin A supplementation trials have produced positive results. In a randomized trial in Dar es Salaam, mothers received daily vitamin A (5000 IU) and beta-carotene (30 mg) as from 12–27 weeks of gestation until the end of lactation, and 200 000 IU of vitamin A were given at delivery. MTCT at 24 months increased by 38% (34.2% versus 25.4%; $P = 0.009$) in infants of mothers randomized to vitamin A. The comparison group received daily multivitamins with no vitamin A (59).

This was the only supplementation trial in which daily vitamin A and beta-carotene supplements were provided during breastfeeding. Current WHO recommendations for maternal vitamin A supplementation in high-risk areas do not extend to the breastfeeding period (60).

It is important to emphasize that, in the above studies, vitamin A supplements were given to women and that there were no findings on vitamin A supplementation in children. Studies on such supplementation for HIV-exposed and HIV-infected children aged 6 to 60 months have consistently shown positive effects on morbidity, nutritional status and mortality (61–63).

In Tanzania, women were randomized to receive a multivitamin product daily containing high levels of vitamins B₁ (20 mg), B₂ (20 mg), B₆ (25 mg), niacin (100 mg), B₁₂ (50 µg), C (500 mg), E (30 mg) and folic acid (0.8 mg). This supplementation was associated with reductions of 39% in fetal deaths, 44% in low birth weight, 39% in preterm delivery before 34 weeks, and 43% in small size for gestational age at birth (Fawzi et al., 1998). Although multivitamin supplementation did not affect the risk of MTCT overall (RR = 1.04) it was associated with reduced transmission in subgroups of women who were nutritionally or immunologically compromised (59).

In Zimbabwe, pregnant women were randomized to daily doses of vitamin A (10 000 IU) and 11 other vitamins and minerals (at single RDA levels) or placebo as from 22–35 weeks of gestation until delivery. Micronutrient supplementation was associated with increases in birth weight of about 100 g in infants born to HIV-positive mothers. The effects of the supplement on outcomes such as HIV disease progression and transmission were not assessed (H. Friis, personal communication).

1.6 ANAEMIA, IRON SUPPLEMENTATION AND HIV

Anaemia, defined as haemoglobin < 110 g/l, affects more than half of all pregnant women in resource-limited settings but is commoner and often more severe in HIV-infected women than in other women (64–66). Severe anaemia, defined as haemoglobin < 70 g/l, is associated with many dangerous outcomes for mothers and infants, including the risks of premature delivery and low birth weight in infants, and maternal mortality (67–68). Premature delivery and low birth weight are associated with increased risks of MTCT (70–72).

For HIV-infected women, anaemia is evidently an independent predictor of more rapid HIV progression and mortality (44, 72, 73) and of increased risk of MTCT (74, 75) after controlling for other indicators of maternal disease progression. Iron stores in tissues, on the other hand, typically measured by blood ferritin concentrations, have been associated with increased HIV load in pregnant women in some studies (76) but not in all (77).

The causes of anaemia in HIV infection are complex (78). In resource-limited settings, anaemia during HIV infection may result from:

- ▶ cytokine-induced suppression of red blood cell production;
- ▶ the use of (cotrimoxazole) for OI prophylaxis;
- ▶ the use of some ARVs (e.g. zidovudine) or drugs for AIDS-associated OI treatment (e.g. gancyclovir) which suppress bone marrow function and red blood cell synthesis;
- ▶ coincidental issues such as coinfections with malaria and hookworm;
- ▶ poor dietary intake and absorption of iron, folate, vitamin A, riboflavin and vitamin B₁₂.

Iron-folate supplementation is a standard component of antenatal care for the prevention of anaemia and the improvement of fetal iron stores during pregnancy. Some studies suggest, however, that supplemental iron given to individuals with HIV may cause increased iron stores in bone marrow and other tissues, oxidative stress, faster HIV disease progression and subsequent increased mortality (76, 79). These adverse effects may be more common in individuals with haptoglobin 2-2, a specific type of this haem-binding protein (Gordeuk et al., 2001) (76, 80). A recent study in Kenya found no effect on viral load of iron supplements (60 mg) taken twice weekly for four months by HIV-positive adults (81).

1.7 NUTRITION AND ARV TREATMENT

Highly active ARV treatment will in almost all adherent patients with fully drug sensitive infection result in suppression of viral replication and dramatic improvement in clinical, immunological, and nutritional status. However, weight loss and wasting may still be observed in some patients on ARV treatment (82) and are associated with reduced survival (83). This may be complex and relate to poor adherence to therapy, resistance virus or poor nutrition.

Lipodystrophy in HIV infected patients (sometimes referred to as fat redistribution, including peripheral lipoatrophy, central fat accumulation or lipomatosis) is common in adults and also has been recently described in children taking protease inhibitors (PI), analogue reverse transcriptase inhibitors (NRTI), or both, for HIV infection (84, 85). This syndrome was first described in 1998 and is characterized by loss of subcutaneous fat from the face, arms and legs, but some patients may have concomitant deposition of excess fat in the neck and upper back, causing a double chin and a buffalo hump, respectively, and in the trunk (84).

Most HIV-infected patients with lipodystrophy are otherwise relatively healthy, but insulin resistance, hypertriglyceridemia, low serum levels of high-density lipoprotein cholesterol and occasionally hyperglycaemia may develop. Hepatic steatosis and hyperglycaemia has been reported, but acanthosis nigricans and lactic acidosis seems extremely rare.

Although several hypothesis have been put forward to account for lipodystrophy, the aetiology and pathogenesis of this syndrome remains ill-defined. There is no internationally agreed case definition for HIV-associated lipodystrophy syndrome, which has led to substantial variations in reports of prevalence (20-80%) (86). Epidemiological and prospective studies suggest that lipodystrophy may be attributable to multiple factors, including the ARV drug that has been used, the stage of the HIV disease and host risk predispositions. Stavudine-based regimens have a higher cumulative prevalence of lipoatrophy than other NRTI or tenofovir based regimens. Combinations based on nelfinavir are associated with more rapid fat loss than efavirenz (85).

Some studies indicate that protease inhibitors impairs the differentiation of peripheral adipocytes by targeting specific mediators that regulate the expression of adipocyte-specific markers. In general, thymidine-based nucleoside analogues have been most associated with lipoatrophy and protease inhibitors drugs most associated with metabolic syndrome. HIV-associated lipodystrophy probably involves multiple drug-associated events in metabolic pathways and in different tissues, as well as host predispositions (such as age, genetics, HIV stage and inflammatory stage) (85).

The morphological changes associated with lipodystrophy are disfiguring and potentially stigmatising, and thus can hinder adherence, cause discomfort and psychological morbidity and reduce effectiveness of antiretroviral treatment. Furthermore, the frequent associated lipid and glucose metabolic abnormalities might increase the risk of cardiovascular disease. It is not clear to what extent lipodystrophy will emerge in nutritionally challenged groups, or the impact this will have on adherence to therapy. To date most studies have been done in industrialized settings in nutritionally replete populations.

Without a full understanding of the molecular mechanisms involved, management approach should be based on some assumptions about probable aetiologies and the palliative treatment of specific symptoms. Switching some components of antiretroviral treatment (from protease inhibitors to non-nucleoside reverse-transcriptase inhibitors or abacavir) and use of metformin, and recombinant human growth hormone have led some success with managing the metabolic manifestations and local fat accumulation (85). However, lipoatrophy remains the most difficult manifestation to manage. Improvement of cosmetic appearance with surgical correction and implants for more obvious morphological manifestations can be considered. With regards to metabolic manifestations, dietary intervention and regular exercises have beneficial effects in dyslipidemia in some patients with lipodystrophy and should be tried before starting fibrates or statins. It is important to note that some statins can interact with antiretroviral and should be avoided. The presence of hyperglycaemia may necessitate the use of oral hypoglycaemic drugs or insulin.

Research on the metabolic consequences of ARV treatment and appropriate strategies for their management is a growing field in industrialized countries where HIV-infected adults and children have had access to long-term treatment. However, studies are necessary in resource-limited settings where management options and follow-up monitoring may be more limited.

2. GENERAL PRINCIPLES

2.1 NUTRITION ADVICE, COUNSELLING, CARE AND SUPPORT FOR HIV-INFECTED WOMEN ARE ESPECIALLY IMPORTANT BECAUSE OF THE DUAL BURDENS OF HIV AND REPRODUCTION (PREGNANCY AND BREASTFEEDING) ON NUTRITIONAL VULNERABILITY

Women living in resource-limited settings are at increased risk of poor nutrition during pregnancy and lactation. HIV-infected women may be at even greater risk because of the effects of HIV on dietary intake, the absorption and use of nutrients and related metabolic processes. Moreover, they may be socially and psychologically vulnerable as a result of living with HIV. For these reasons they may require enhanced follow-up and support so that they can achieve adequate nutrition during antenatal and postnatal care.

2.2 ALL ANTENATAL AND POSTNATAL WOMEN CAN BENEFIT FROM NUTRITION ADVICE, COUNSELLING, CARE, AND SUPPORT AIMED AT PREVENTING MALNUTRITION DURING PREGNANCY AND IMPROVING REPRODUCTIVE HEALTH AND CHILD HEALTH OUTCOMES

Nutrition counselling, care and support begin with an assessment of a woman's specific circumstances, including her nutritional status, her diet and the social and other conditions that could prevent her from achieving adequate dietary intake. Nutrition counselling should cover:

- ways of achieving adequate weight gain during pregnancy;
- the prevention of anaemia;
- the importance of an adequate diet to support lactation and prevent nutritional depletion associated with childbearing (87, 88).

2.3 THE FOCUS OF NUTRITION, ADVICE, COUNSELLING, CARE AND SUPPORT VARIES WITH THE HEALTH STATUS OF THE CLIENT

For HIV-infected women who are asymptomatic, emphasis should be placed on the need to stay healthy by improving eating habits and the nutritional quality of the diet, maintaining weight (or gaining adequate weight during pregnancy), preserving lean body mass, continuing physical activity and ensuring an understanding of food safety. Some women, particularly women who are unable to gain adequate weight during pregnancy, are losing weight or are experiencing acute food insecurity at home, may require direct food assistance. Food assistance protocols depend on the services and food programmes that are available locally. For women who are experiencing HIV-related infections and illnesses and/or weight loss the main objective is to minimize the nutritional consequences of the infections by obtaining immediate treatment, maintaining the greatest possible food intake during acute infection, increasing food intake during the recovery period, and continuing physical activity as much as possible so as to preserve lean body mass. For women who have advanced disease or persistent HIV-related infections and illnesses the main objective is to provide comfort and palliative care, with modification of the diet according to the symptoms and with encouragement for eating. For women on ARV treatment the focus of nutrition counselling, care and support should be the management of drug and food interactions and other side-effects of treatment.

2.4 WOMEN RECEIVING ARV AND OI TREATMENT SHOULD BE GIVEN ADVICE AND COUNSELLING ON RELATED NUTRITIONAL ISSUES AND SHOULD BE FOLLOWED UP IN ORDER TO MONITOR AND TREAT ANY ADVERSE NUTRITIONAL COMPLICATIONS

Treatment advice and counselling on nutrition issues related to ARV and OI treatment cover the timing of pill ingestion in relation to meals, the minimizing and management of nutrition-related side-effects of prescribed medications (e.g. nausea and vomiting), and the consequences of long-term ARV treatment for body fat distribution and metabolism. Nutrition advice and counselling should also cover the food and water requirements of some ARV drug regimens, e.g. PI-based regimens. The role of diet and exercise in managing body fat distribution and the metabolic changes associated with the long-term use of ARV drugs is not known. However, women should be made aware that, depending on the regimens used, physical changes may occur. Advice should be given on how to cope with such changes. Underlying or new conditions that require dietary modifications, e.g. diabetes mellitus, should be monitored during follow-up care.

3. RECOMMENDATIONS

The following recommendations are based on the evidence previously reviewed and, where definitive evidence is lacking, on expert opinion. Where the basis for a specific recommendation is expert opinion this is indicated in the text.

The recommendations cover:

- ▶ nutrition assessment;
- ▶ nutrition counselling and support;
- ▶ use of micronutrient supplements;
- ▶ management of wasting;
- ▶ nutritional considerations for persons on ARV treatment.

It will be necessary to review these recommendations regularly and to update them as new information becomes available.

3.1 NUTRITION ASSESSMENT

These recommendations are based on expert opinion.

A baseline nutrition and dietary assessment should be carried out when a woman is first seen during pregnancy or postnatal follow-up, regardless of her HIV status. The purpose of this assessment is to gather information about her current nutritional status and dietary practices and to identify risk factors for developing future nutritional complications.

The baseline nutritional status assessment should include at least the measurement of weight and haemoglobin. If possible, additional body measurements can be taken, such as height (to allow calculation of $BMI = \text{kg}/\text{m}^2$) and mid-upper arm circumference (to allow a crude estimation of muscle wasting). WHO reference tables can be used to classify maternal nutritional status on the basis of these measurements (89). Data from resource-limited settings indicate that non-pregnant women with BMI values below 18.5 are nutritionally vulnerable and that women who also have mid-upper arm circumference values below 23.0 cm are at even greater nutritional risk (90, 91).

The dietary assessment should include information on usual eating patterns and intake, appetite and eating problems, and household food security. Each woman should receive a baseline physical examination in order to identify any conditions requiring treatment which affect appetite and the ability to eat or involve altered nutrient absorption. All medications taken on a daily basis should be noted so that nutrient interactions and/or contraindications can be identified. After the baseline assessment, HIV-infected women should return for routine antenatal and postnatal care in accordance with the same protocols that are used for the general population.

3.2 NUTRITION COUNSELLING AND SUPPORT

These recommendations are based on existing WHO guidance, the evidence review and the report of a WHO technical consultation (92).

3.2.1 DIETARY RECOMMENDATIONS

Dietary recommendations for women with HIV are similar to those for the general population. The following issues have to be taken into consideration (92).

- ▶ Energy requirements are increased by 10% for the maintenance of body weight and physical activity in asymptomatic HIV-infected adults because of increased resting energy expenditure.
- ▶ During symptomatic HIV and subsequently during AIDS there is an increase in energy requirements of about 20% to 30% for the maintenance of body weight.
- ▶ Currently available data do not provide sufficient support for an increase in protein requirements during HIV infection among adults in general and among pregnant and lactating women in particular. High-protein supplements alone do not prevent wasting or an increase in muscle mass.
- ▶ The available evidence suggests that HIV-infected individuals may require more than 1 RDA¹ per day in order to reverse deficiencies in several nutrients. The current recommendation for HIV-infected women is therefore to consume a diet that is nutritionally adequate rather than to rely on high-dose supplements of vitamins and minerals. In areas where

¹ Recommended daily allowance for nutrients that are essential for health. Daily intakes below RDA levels may be associated with negative health outcomes.

there are multiple micronutrient deficiencies, however, a daily supplement given to HIV-infected pregnant and lactating women may improve both birth outcomes and maternal health.

Healthy women require an additional energy intake of 200 kcal/day during pregnancy and of 500 kcal/day during lactation. Protein and most vitamin and mineral requirements are also increased (33). Nutrient requirements are greater in women with low pre-pregnancy weight, inadequate weight gain during pregnancy and poor diet quality and diversity, and in women who engage in physically demanding activities with high levels of energy expenditure.

3.2.2 FOOD SAFETY RECOMMENDATIONS

WHO recommendations on food safety for the general population also apply to HIV-infected women and should be part of their counselling and support. These recommendations cover the following key areas:

- ▶ keeping hands and food preparation areas clean;
- ▶ separating raw foods from cooked foods and the utensils used with them;
- ▶ cooking fresh and reheated foods thoroughly;
- ▶ keeping food at safe temperatures;
- ▶ using safe water and raw materials.

More detailed guidance on these areas is available (93).

3.2.3 RECOMMENDATIONS FOR THE TREATMENT AND MANAGEMENT OF INFECTIONS

Immediate treatment for all conditions and symptoms affecting health and nutrition is an important first response in HIV-related care. Moreover, symptom-based nutritional management may help to minimize the nutritional consequences of HIV, related illnesses and treatments.

3.3 IRON SUPPLEMENTATION

These recommendations are based on existing WHO guidance.

WHO currently recommends daily iron-folate supplementation (400 µg folate and 60 mg iron) during six months of pregnancy in order to prevent anaemia, and twice daily supplements in order to treat severe anaemia (haemoglobin < 70 g/l). The available data do not support a change in this recommendation for women living with HIV.

3.4 VITAMIN A SUPPLEMENTATION

Well-designed randomized controlled trials have shown that, in HIV-infected women, daily antenatal and postnatal vitamin A supplementation does not reduce MTCT and that, in some settings, it may increase the risk of HIV transmission. Because of the lack of a beneficial effect of vitamin A supplementation and, indeed, a harmful effect in one study, the daily vitamin A intake during pregnancy and lactation should not exceed the RDA.

In areas where vitamin A deficiency is endemic, WHO currently recommends a single high dose of vitamin A (200 000 IU) for women as soon as possible after delivery and not later than 6–8 weeks after delivery. Research is in progress to assess further the effect of single-dose postpartum vitamin A supplementation in HIV-infected women. At present the WHO recommendation for postpartum vitamin A supplementation should be followed for HIV-positive women.

3.5 MANAGEMENT OF WASTING

These recommendations are based on expert opinion relating to all women.

- Screen for causes of weight loss, including household food insecurity and underlying diseases, especially tuberculosis and chronic diarrhoea, and treat as needed.
- Counsel on increased nutritional needs and appropriate local foods.

For women who are HIV-infected

- Refer for consideration of commencement of ARV treatment.
- Refer for additional care, including programmes that can provide family food assistance in cases where food insecurity is identified.

- ▶ Advise that physical exercise be taken in order to increase strength and muscle mass.

3.6 NUTRITIONAL CONSIDERATIONS FOR PERSONS ON ARV TREATMENT

These recommendations are based on WHO ARV treatment guidelines (3) and expert opinion.

- ▶ Provide treatment advice on dietary needs or restrictions of specific ARV drug regimens (e.g. food and water requirements of some PI-based regimens).
- ▶ Provide health education, information and advice on managing common side-effects, such as diarrhea, nausea and vomiting.
- ▶ Counsel on dietary modifications as needed in response to the metabolic syndrome associated with ARV treatment.

SUMMARY OF RECOMMENDATIONS

Recommendation	HIV+ asymptomatic	HIV+ symptomatic	On ARV treatment
Nutrition assessment	Yes	Yes	Yes
Dietary recommendations:			In accordance with symptoms
- Energy intake	Increase by 10%	Increase by 20–30%	
- Protein intake	No change	No change	
- Micronutrient intake	At least 1 RDA or daily supplement	At least 1 RDA or daily supplement	
Food safety counselling	Yes	Yes	Yes
Symptom-based nutritional advice	No	Yes	Yes
Iron supplementation	As per existing WHO guidelines	As per existing WHO guidelines	As per existing WHO guidelines
Vitamin A supplementation	As per existing WHO guidelines; daily intake not to exceed 1 RDA.	As per existing WHO guidelines; daily intake not to exceed 1 RDA.	As per existing WHO guidelines; daily intake not to exceed 1 RDA.
Management of wasting	No	Screen for causes and treat as needed; counsel on increased food consumption; refer for ARV treatment and family food assistance as needed.	Screen for causes and treat as needed; counsel on increased food consumption; refer for review of ARV treatment as it may indicate treatment failure/need to switch to second line therapy; refer for family food assistance as needed.
Nutritional considerations for persons on ARV treatment	No	No	Provide advice on dietary needs and restrictions; counsel on management of nausea and related side-effects; manage toxicity and treatment failure as per WHO guidelines.

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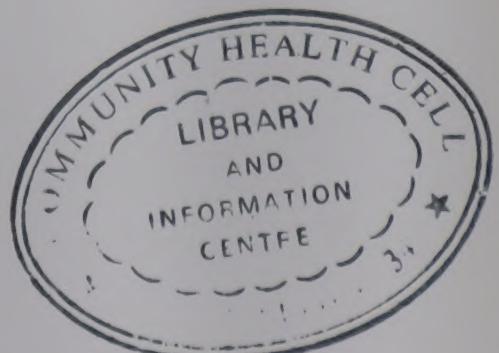
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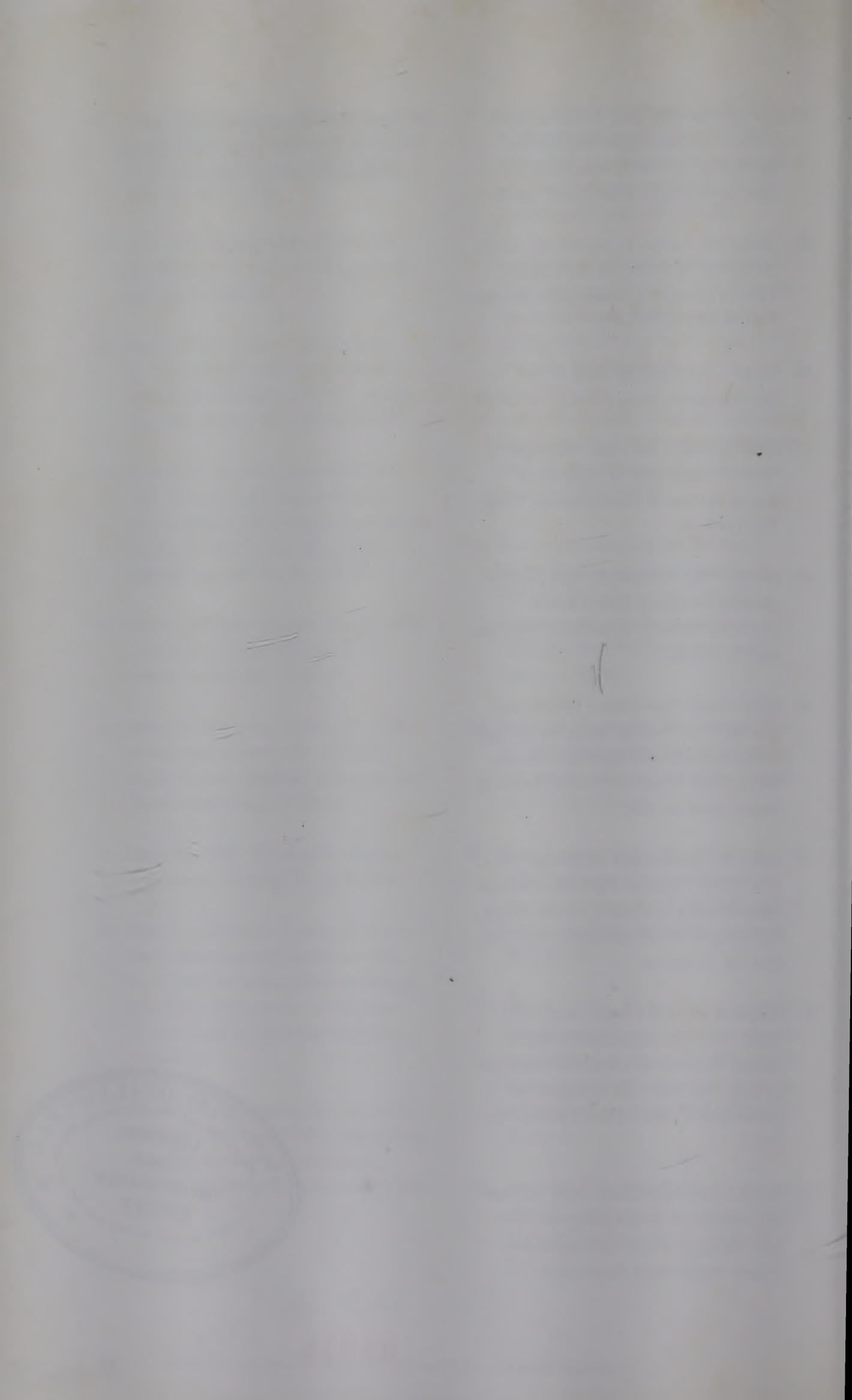
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